INCOSE SINGAPORE SYSTEMS ENGINEERING DAY | SEPTEMBER 27, 2024

IBM Engineering Lifecycle Management

Digital Continuity in Action!

Lunch & learn Session

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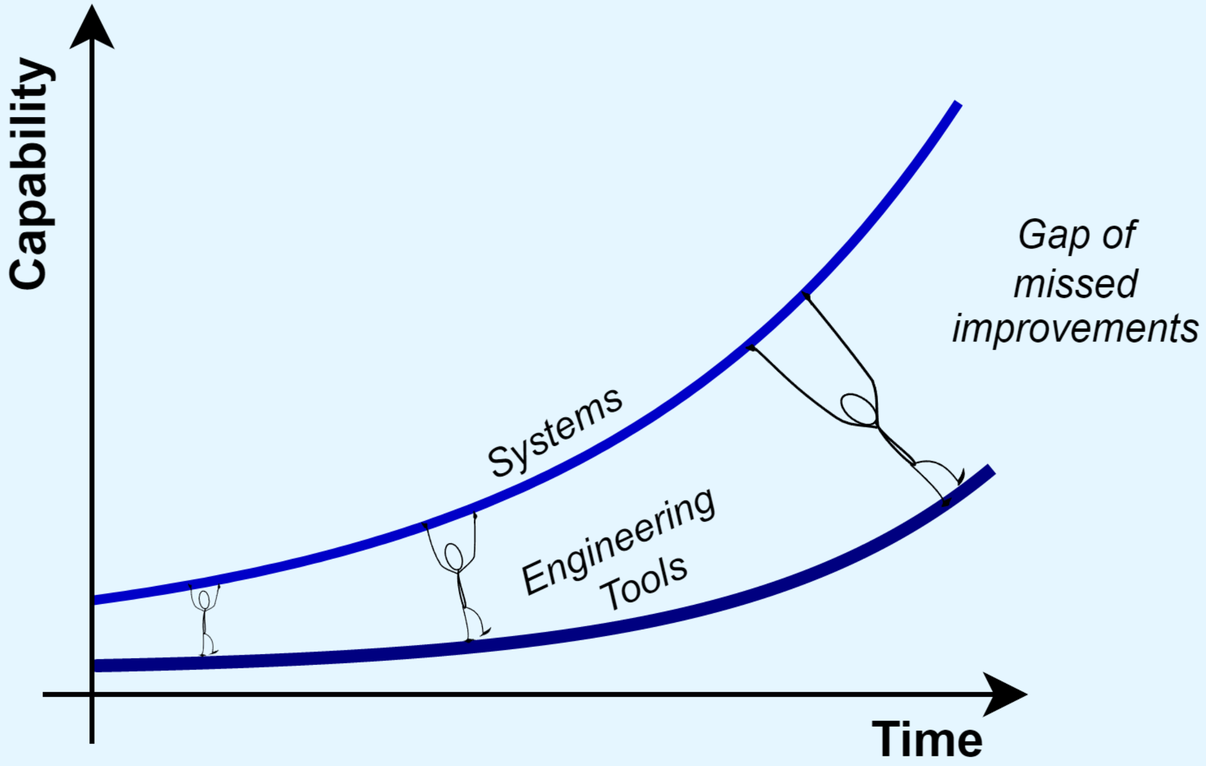
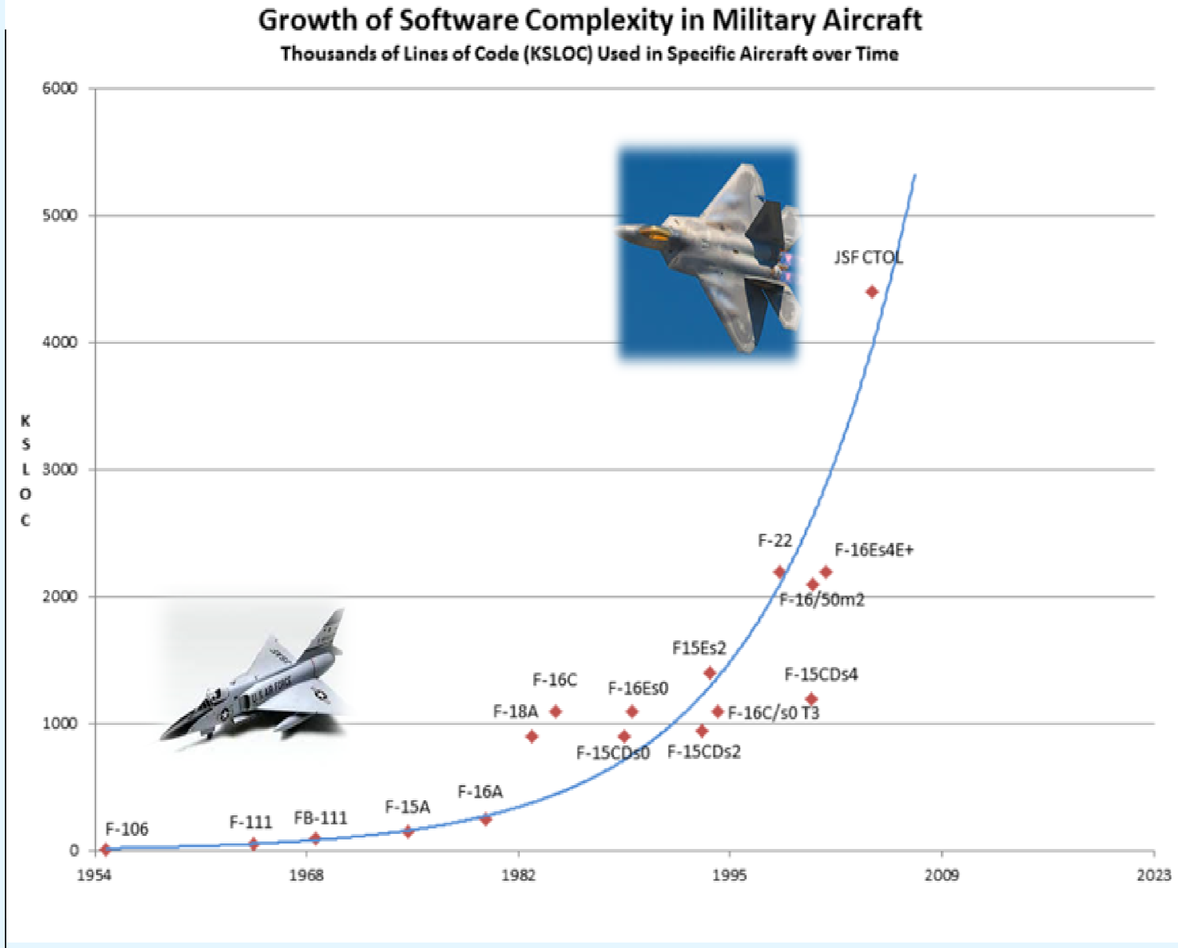
IBM DASSAULT SYSTEMES Capella VIETSOL BLUEKEI SOLUTIONS

The need for engineering digitalization



Commonly, *the systems we develop surpass the capabilities of the tools used to create them*. Project heroes often bridge the gap. People who, through their dedication and expertise, enable organizations to develop great systems. *As systems evolve, this gap widens.*



Developing new electrified engines will require sophisticated software based on functional standards compliance

Autonomous military vehicles are produced for tough environmental conditions

The Pentagon's fiscal 2020 budget proposal included nearly $4 billion in research and development for unmanned and autonomous technologies

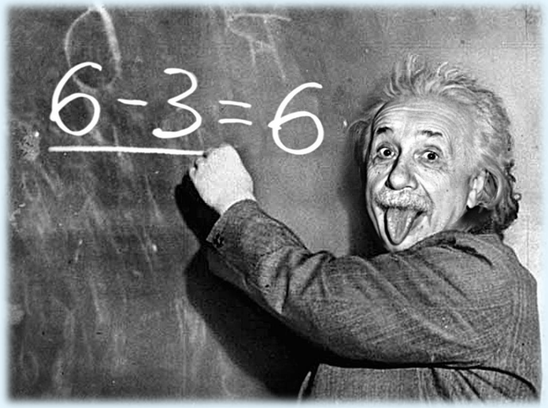
The problem of Complexity

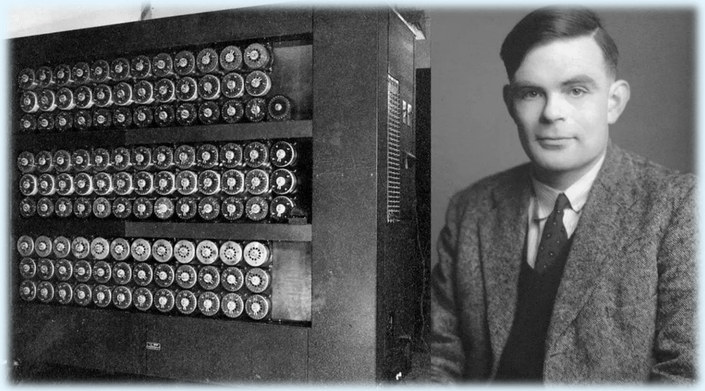
F-35 Fighters will cost $22B more than expected

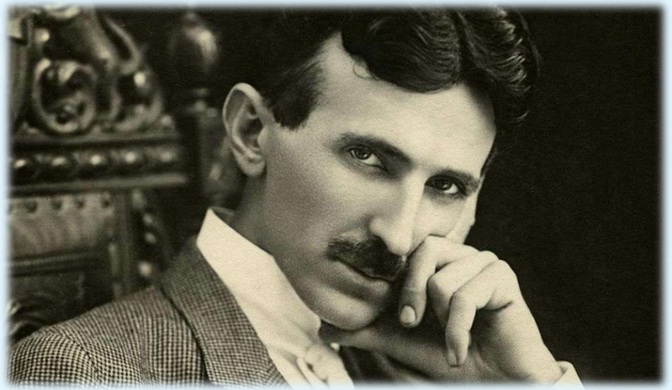
Boeing 737 Max 2 fatal accidents, 300+ victims and all the aircrafts fleet grounded since almost 1 year with a total loss estimated in several billions of dollars.

As of 1 June 2020, the CO2 Emission scandal had cost Volkswagen $33.3 billion in fines, penalties, financial settlements and buyback costs.

It is not about how big your IQ is..

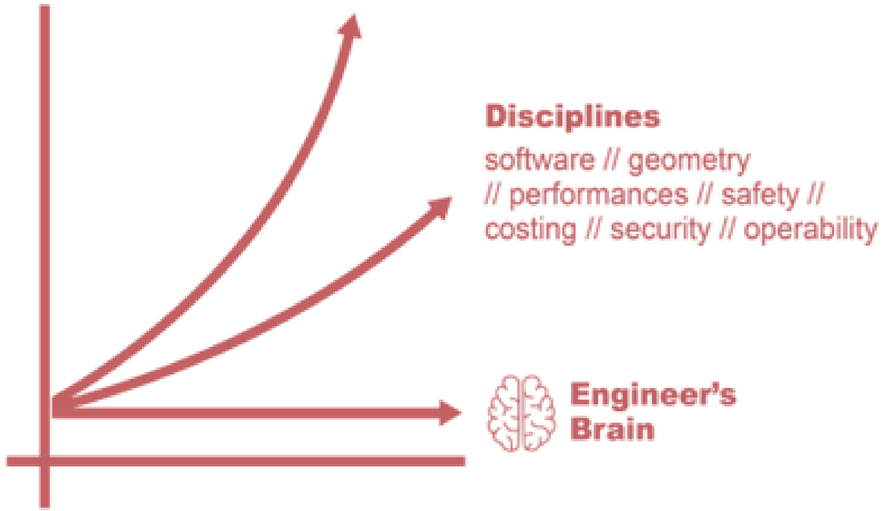


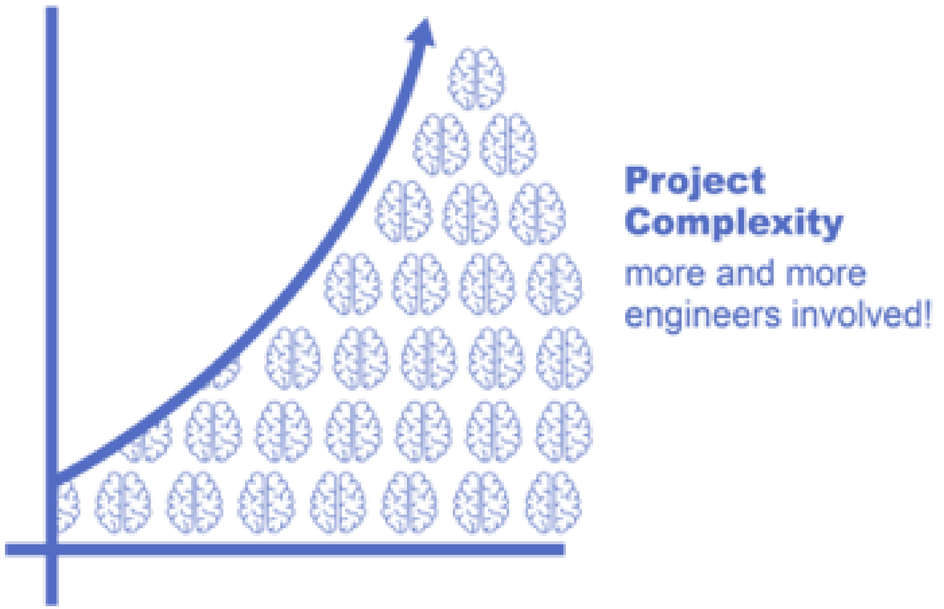




Project Complexity

multi location // industrial workshare // technology





In a nutshell:

Engineering organizations make things or services which are mission, business or safety critical

IBM ELM is the backbone of these engineering and IT projects

IBM Engineering Lifecycle Management addresses

Complexity
deliverables span multiple components, versions, or systems

Compliance
regulatory, legal, or internal standards

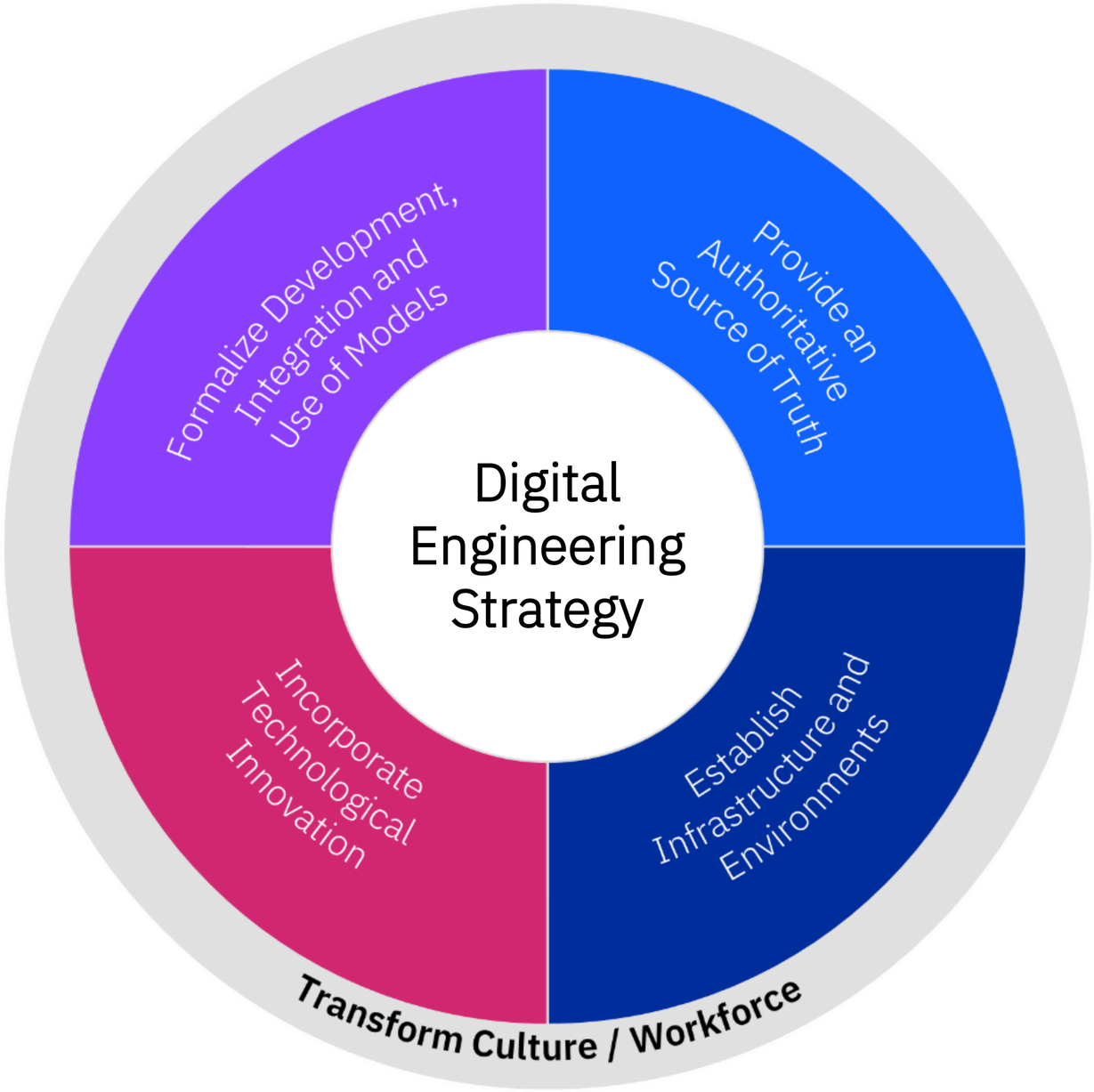
Critical
security, safety, and reliability are essential

Collaboration
large development organizations or partner/supplier chains

Digital Engineering strategy

The US DoD coined the term Digital Engineering Strategy, that outlines five elements necessary for the digital engineering ecosystem to thrive:

- Formalize the development
- Provide an enduring source of truth
- Incorporate technological innovation
- Establish supporting infrastructure
- Transform the culture to adopt digital engineering.



How IBM can uniquely help

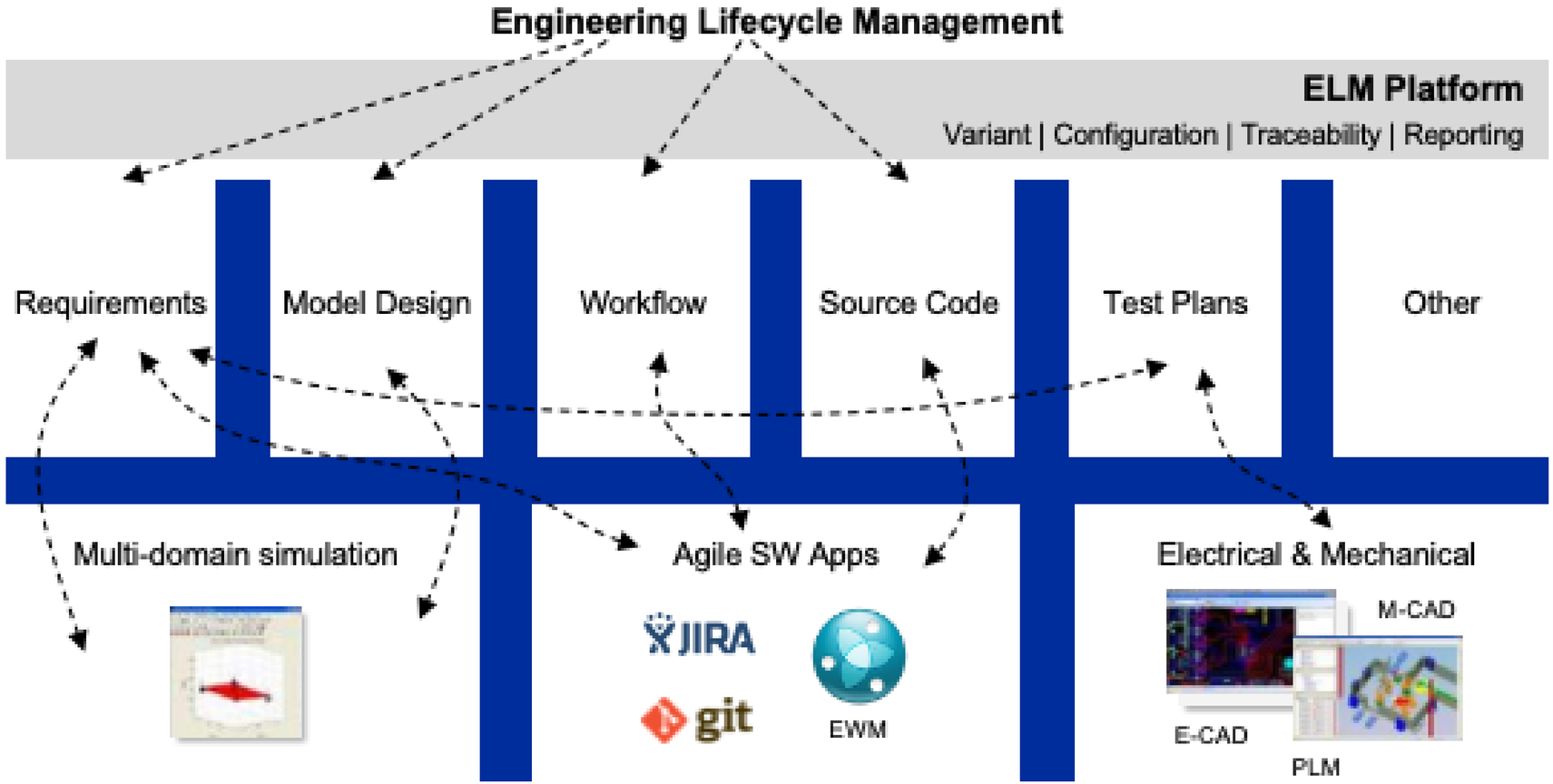
IBM ELM goals

Infuse engineering quality

Streamline standards compliance

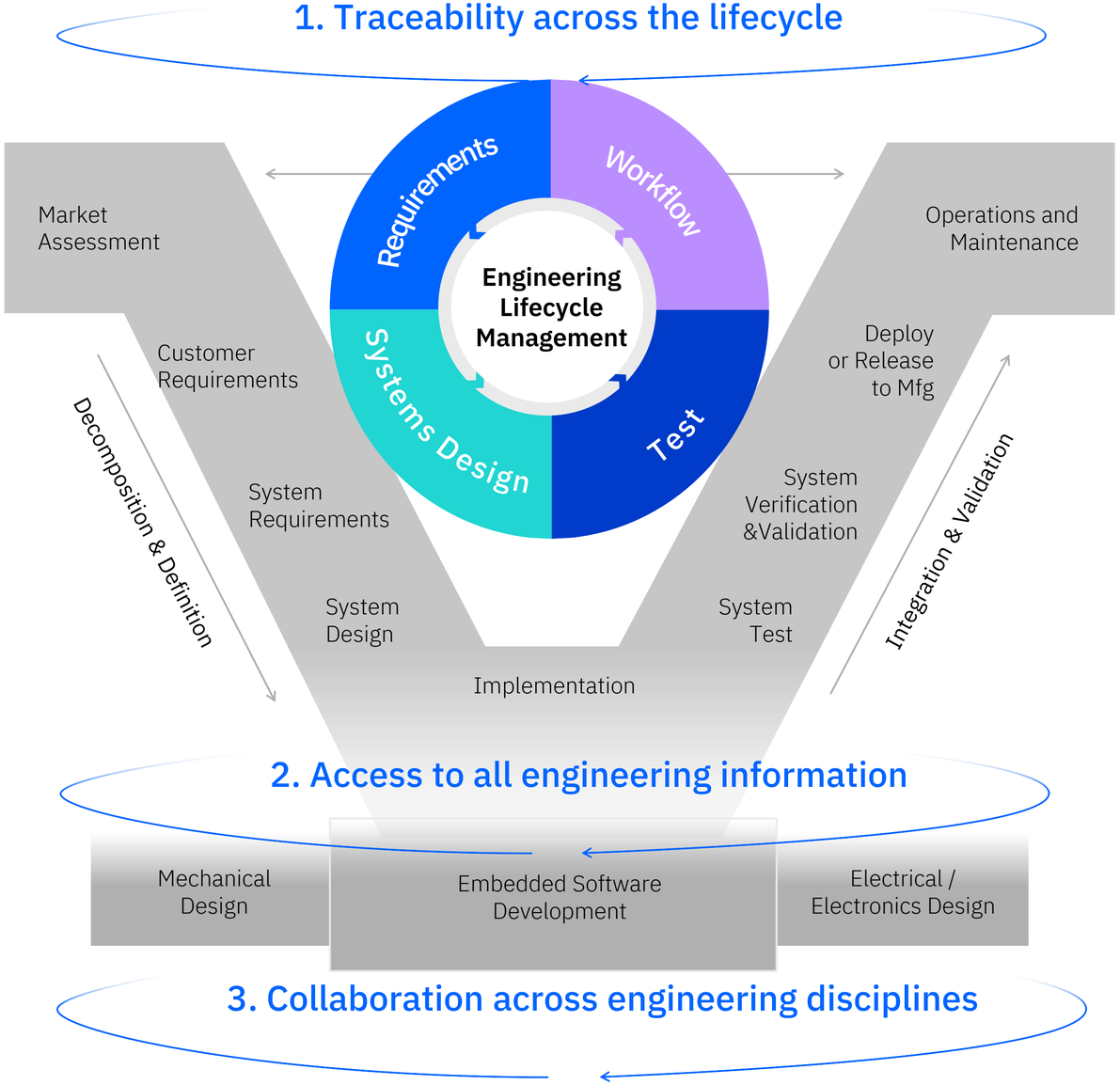
Accelerate time to innovation

IBM Engineering Lifecycle Management (ELM) platform



IBM Engineering Lifecycle Management (ELM)

Accelerating engineering across the Systems V



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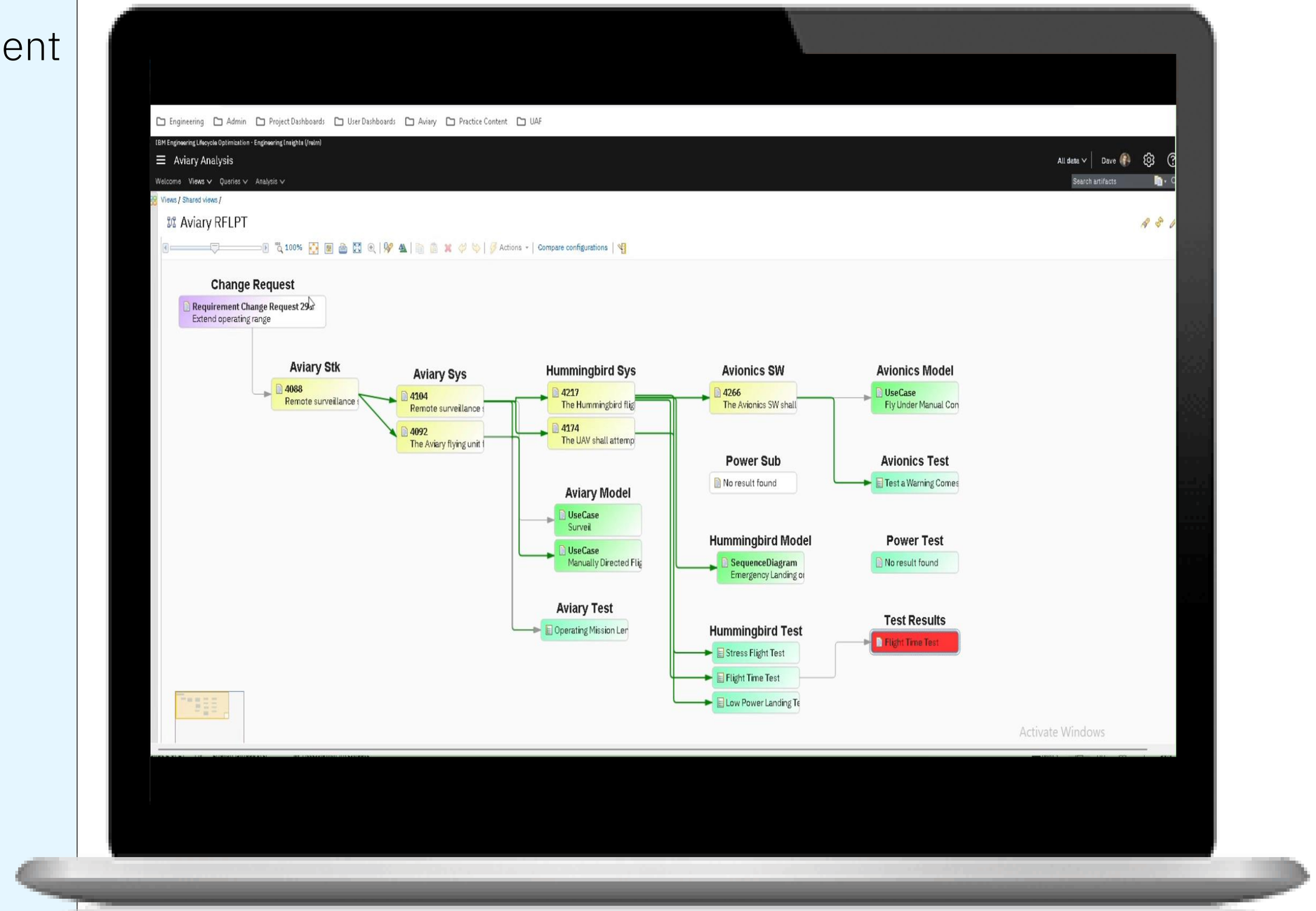
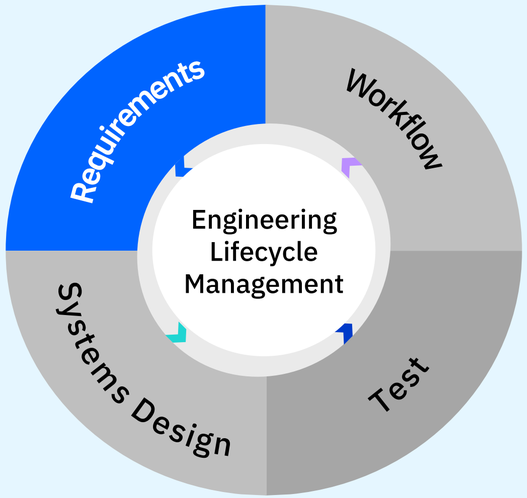


IBM Engineering
Requirements Management

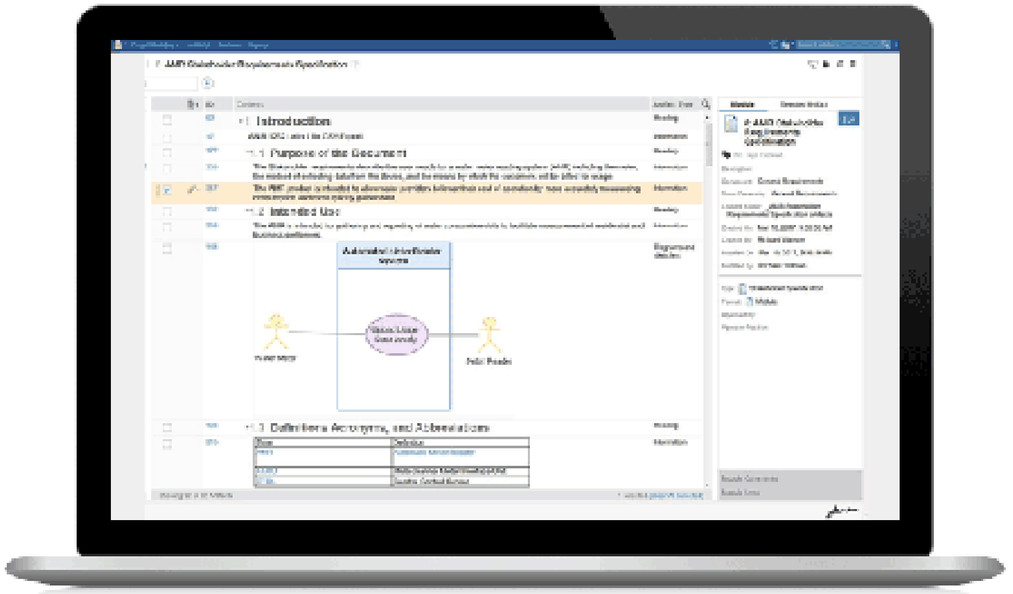
DOORS Next

Offering a single platform for managing requirements so teams can work more effectively across disciplines, time zones and supply chains



Benefits

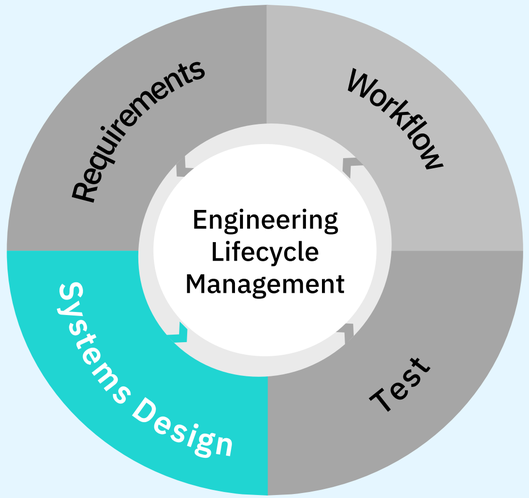
- Collaboration
- Change Management
- Traceability
- Transparency



IBM Engineering
Systems Design

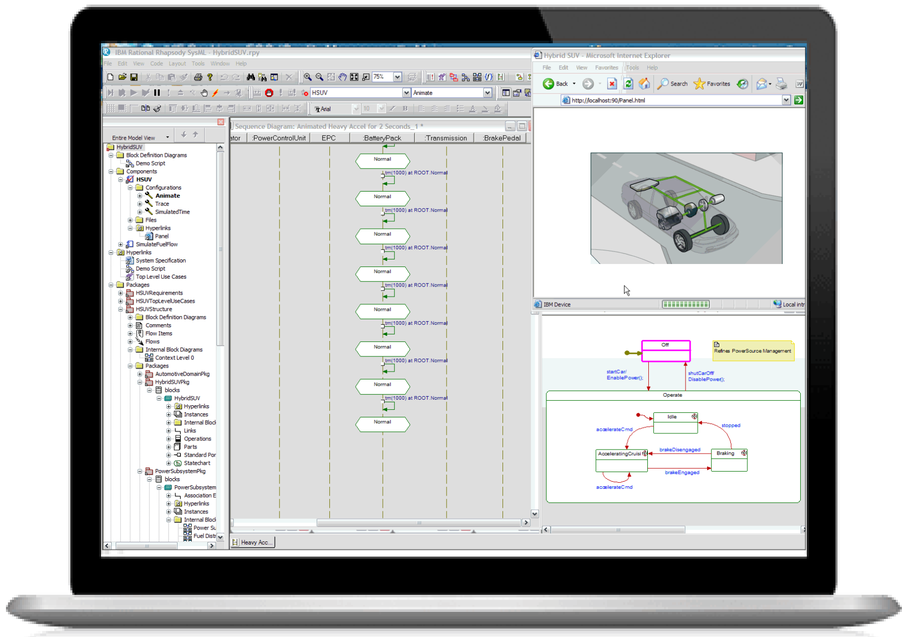
Rhapsody

Offering a structured and auditable approach to analyzing and elaborating requirements through prototypes, simulations and verification of validated designs while facilitating improved productivity and quality.



Benefits

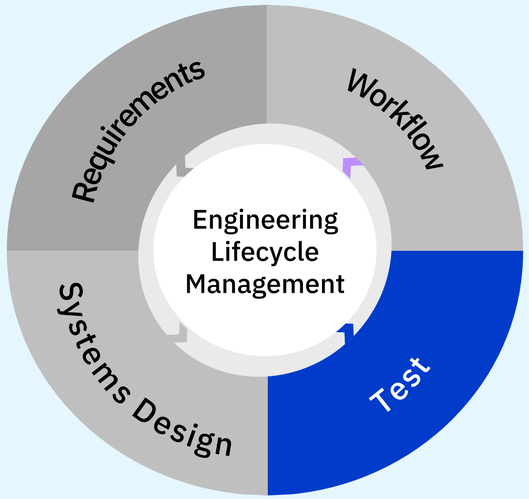
- Time to value
- Consistency
- Quality
- Compliance
- Transparency



IBM Engineering Test Management (ETM)

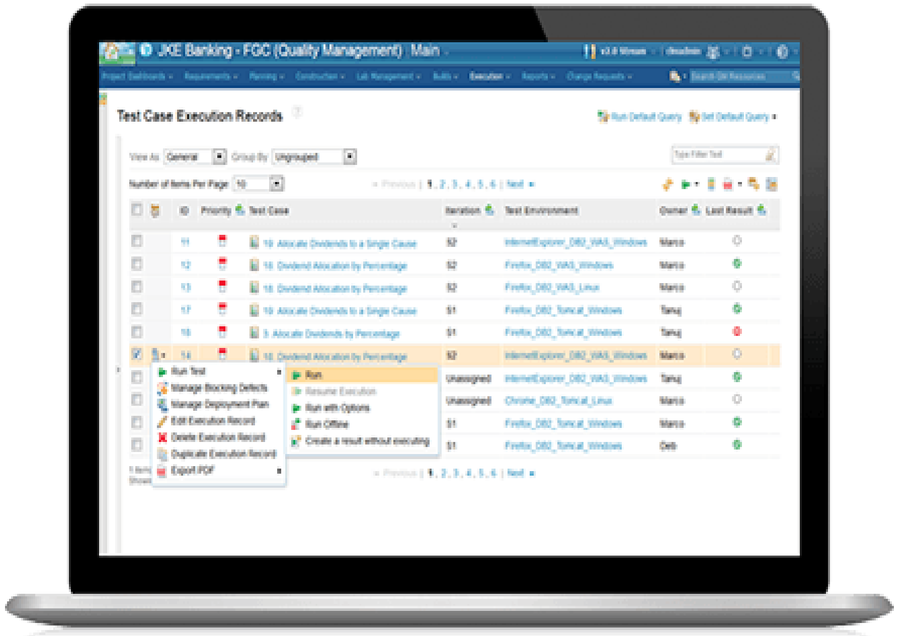
Test Management

Offering a collaborative and comprehensive test planning and test management platform to detect defects, leverage automation and reports on metrics, and manage testing process.



Benefits

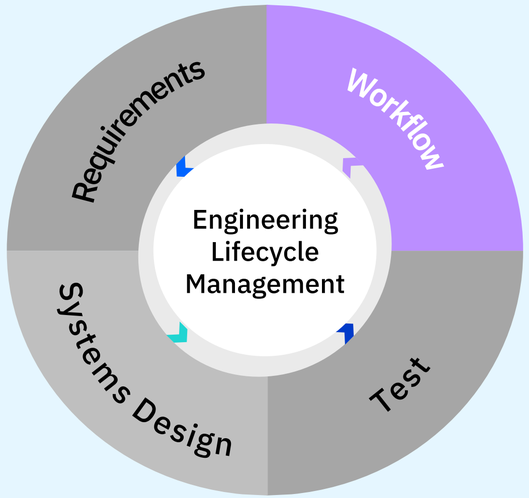
- Analysis
- Quality
- Compliance
- Automation
- Prediction



IBM Engineering
Workflow Management (EWM)

Workflow Management

Offering a single platform for managing processes, tasks, and people, so teams can work more effectively across disciplines, time zones and supply chains



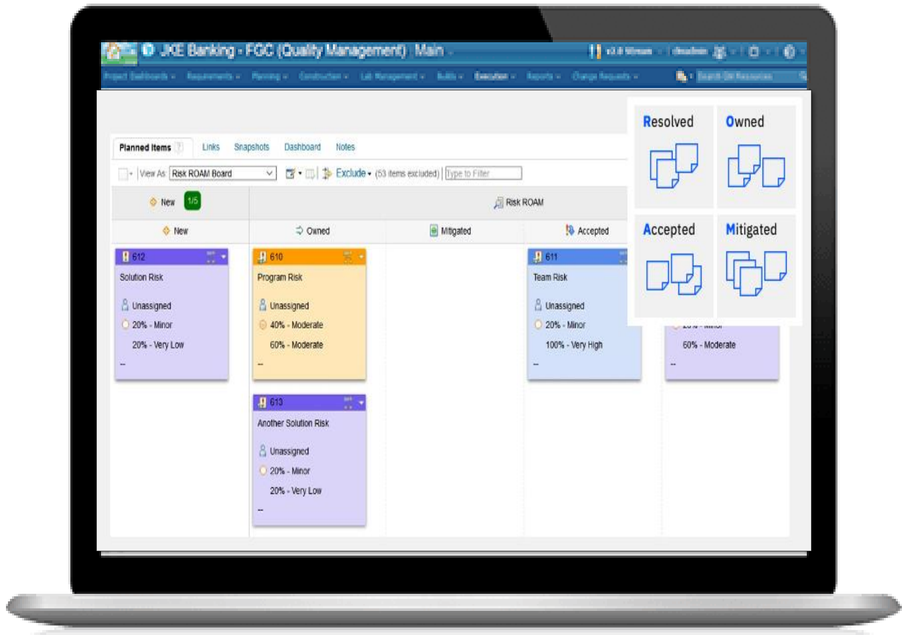
Benefits

Work item management

- Transparency
- Flexibility
- Control
- Collaboration

Source code

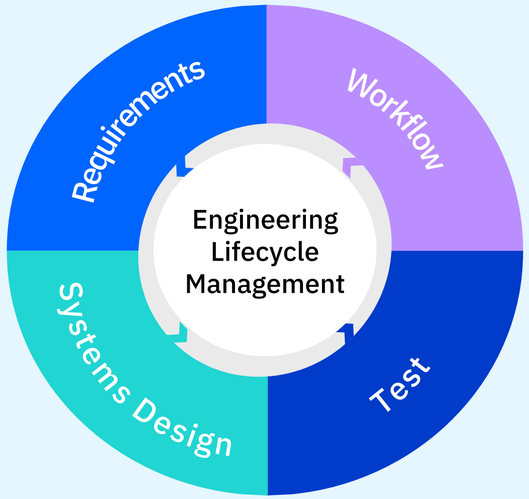
- Quality
- Audit Trail



IBM Engineering
Optimization

Publishing and Insights

Automates the generation of document-style reports across the IBM ELM environment and third-party tools for formal review, contractual obligations, regulatory oversight, or ad hoc use. Insights help visualize and analyze data across the product development lifecycle.



Benefits

- Easy Report Building
- 3rd Party Tool Data
- Useful Information
- Automated Documentation
- Agility
- Linked Data

IBM Engineering
Integration Hub

Integration Hub

IBM Engineering Integration Hub extends the IBM Engineering Lifecycle Management (ELM) solution with integrations to a number of third-party tools.

Using Integration Hub, customers can practice ELM in a diverse lifecycle tools environment, allowing them to leverage their current lifecycle tools investments.

Benefits

Heterogenous

Automatically synchronize data and updates between IBM Engineering Lifecycle Management solution and third-party tools

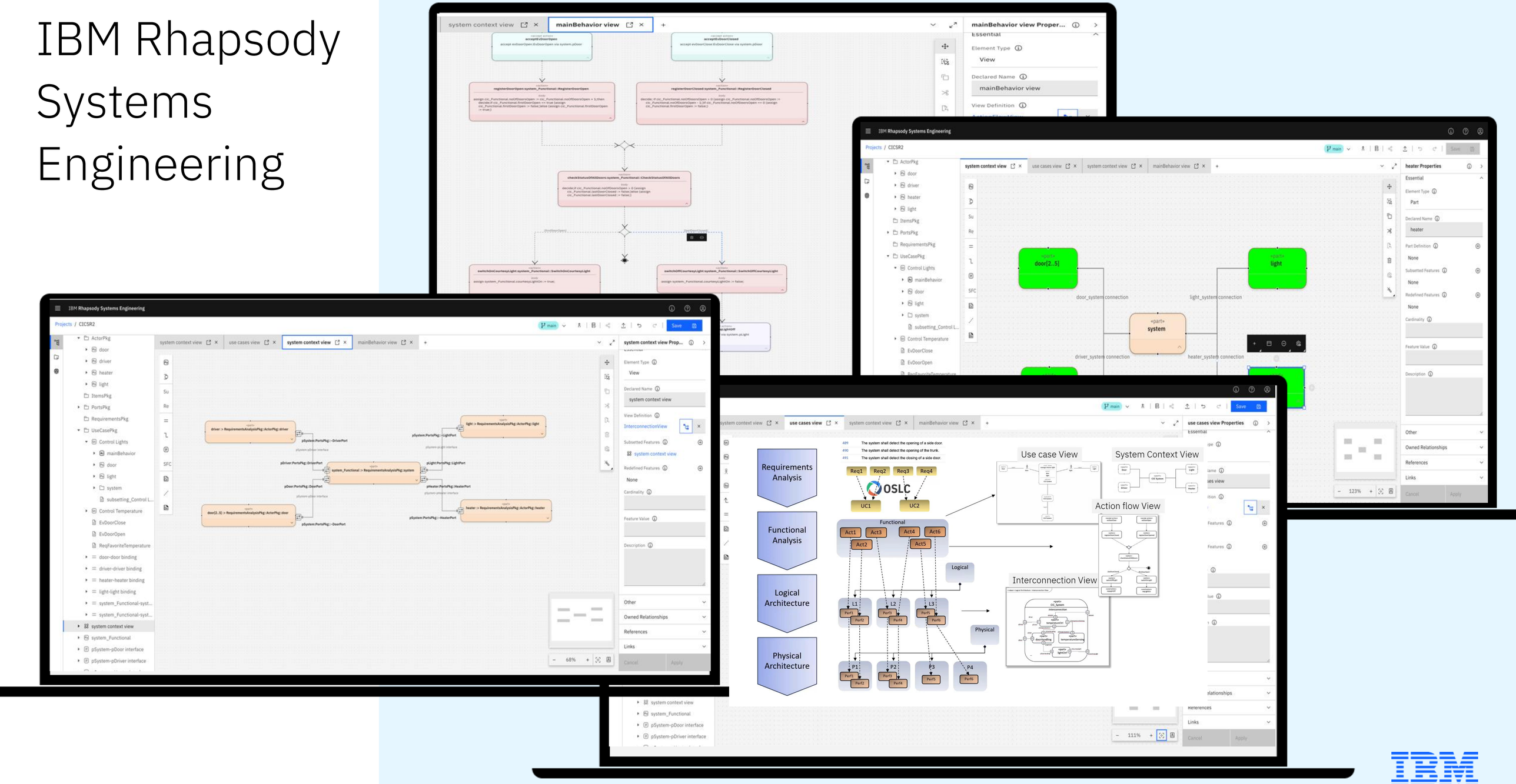
Agile

Automated and continuous lifecycle tool integration allows more frequent builds and releases required for DevOps and engineering lifecycle management solutions

Scalable

Model-based integration, with linked data specifications and other vendor-neutral services, allow organizations to adopt new tools from many providers

IBM Rhapsody Systems Engineering



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Rail Projects Victoria

Keeping Melbourne’s most complex rail project on time and on track

IBM **Engineering**

Business problem

The Metro Tunnel Project will transform Melbourne’s rail network. How can Rail Projects Victoria (RPV) manage the thousands of requirements of this AUD 11 billion initiative and deliver it on time and on budget?

Solution

To manage the complex requirements of the Metro Tunnel Project, RPV chose Engineering Requirements Management DOORS Next technology, a software as a service (SaaS)-based solution delivered through the IBM Cloud platform.

RPV gains a single, collaborative and security-rich environment that allows it to manage project requirements in real time across the project lifecycle.

In addition to increasing visibility and traceability across the project lifecycle, IBM technologies are helping RPV recognise and mitigate risks, delays and unwanted expenditures that can stem from unforeseen changes.

Outcome:

- Provides a collaborative, security-rich cloud environment
- Helps mitigate risks and delays stemming from changes
- Allows repeatability and consistency

Solution components:

- IBM® Cloud™
- IBM Engineering Lifecycle Optimization – Publishing
- IBM Engineering Requirements Management DOORS Next
- IBM Engineering Workflow Management Contributor SaaS

TURKISH AEROSPACE MALAYSIA

TUSAS chooses **IBM Engineering Lifecycle Management** as the preferred digital engineering platform

Client Background:

Turkish Aerospace Malaysia (TUSAS) is a new branch office of Turkish Aerospace and serves as its first engineering and design office in Southeast Asia. It focuses into unmanned aerial vehicles, jet trainers, helicopter projects and modernisation programmes for the global aviation ecosystem.

Business problem:

With ambition of being in the top 10 aerospace companies by 2030, TUSAS realizes that it can no longer rely on emails, Word and Excel documents in its design and development processes. They needed a unified platform for the four teams - namely Systems, Software, Avionics and Projects Management - to collaborate efficiently especially now that they're hiring more engineers into their fold.

Solution:

IBM Engineering Lifecycle Management (ELM) platform provides TUSAS with a powerful and integrated solution to optimize their engineering development processes.

The platform's robust and market-leading Requirements Management capabilities allow precise definition, tracking, and management of requirements, ensuring compliance with DO178 and DO254. Workflow Management with agile planning capabilities help foster collaboration among the various teams. For Model-based Design & Development, ELM facilitates seamless collaboration between Systems and Software engineers, streamlining the translation of models into code. Moreover, the Test Management capabilities accelerate test automation and improve defects tracking.

IBM **Engineering**

Outcome:

- Accelerate & optimize software development processes
- Improve team collaboration
- Ensure compliance with DO178 and DO254
- Achieve end-to-end traceability

Solution components:

- IBM ELM Suite (Requirements, Design, Workflow & Test Management)

"IBM ELM has revolutionized our aerospace and defense engineering processes. Its robust tools for requirements management and collaborative workflows help boost our productivity, ensuring top-notch design and development outcomes. A game-changer!"

Mohd Shahiman Sulaiman
CEO
Turkish Aerospace Malaysia

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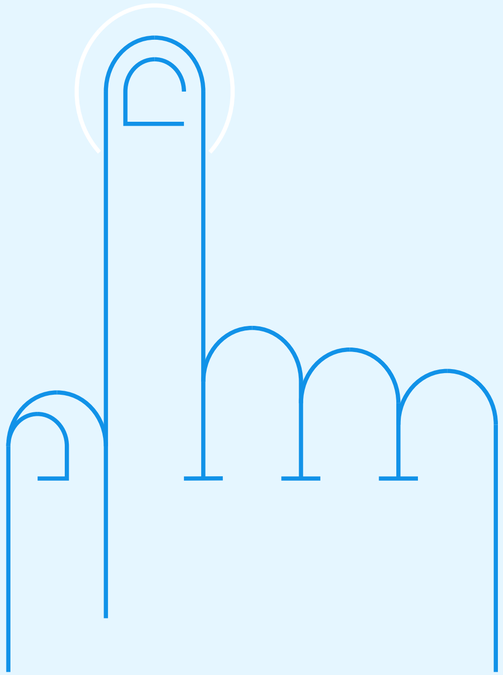
Get started with ELM today



Adopt the whole solution or start small by adopting one capability – for either requirements, systems & software architecture (modelling), workflow, or testing.

Deploy on premise or on cloud, users can access the solution using the web client of their choice.*

*Systems Design Rhapsody and DOORS provide workstation rich clients

24/7

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